

# Future Work in Task 5

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April 5, 2005

# Original Task 5 Scope

- **Create a failure rate database, populated with “finished” component failure rate values - defensible but mainly generic data - to support probabilistic safety assessment of fusion facilities**
- **We have made progress toward this original goal. Tonio created a computerized database and keeps it active. We have ‘mined’, ‘farmed’, or ‘harvested’ generic data from other industries to place an initial set of values into the database. Some of that work supported the ITER EDA.**
- **We agreed to bifurcate the task into short term generic data collection and longer term collection and analysis of actual fusion operating experience data**
- **Task members have accessed operating experience data from fusion facilities - namely tokamaks (JET, DIII-D, FTU) and tritium facilities (JET, TPL, TSTA, and TLK) - and Tonio has performed skillful data analysis to produce specific failure rates**
- **We are meeting and exceeding our original goal**

# Task Future

- **Three key issues from the last several years:**
  - **1) the ITER design has scaled down to a less aggressive step forward, so existing machine experiences better apply to ITER**
  - **2) the major tokamaks and facilities have now operated for enough years to provide statistically significant data**
  - **3) our task has developed good ties to several operating facilities**
- **We should continue to work through these ties and support other safety-relevant work, such as**
  - **Reliability, Availability, Maintainability, and Inspectability (RAMI)**
  - **Occupational Radiation Exposure**
  - **Occupational Safety**
  - **Any other historical data evaluation needs**

# Reliability data can have many uses

- **Besides Safety Analyses/PRA, there are some other safety-related areas that our task's reliability data can support ITER:**
  - **In general, new experimental facilities will have system reliability and/or availability estimates performed as an initial “benchmark” or starting point for assessing how well the systems are operating. Our data can support the initial quantification of system reliability estimates for ITER and its satellite facilities.**
  - **It will be very expensive for a first-of-a-kind machine like ITER to achieve high reliability. Life cycle costs of equipment may be required to determine the optimum replacement intervals.**
  - **Reliability of personnel safety equipment may be needed; especially data from operating tokamaks. For example, radiation and other safety monitors need reliability values to support estimation of necessary reserve units to have on hand when the primary monitors must be taken out of service for testing and calibration.**

# Reliability data can have many uses

- **System maintenance and test scheduling.** Generally, with a new plant the maintenance planners will use manufacturer recommendations to build the initial schedules. If our fusion-specific information shows better or worse component performance, or a predominant failure tendency, we may be able to influence the planning process for ITER's benefit. Reliability Centered Maintenance has been shown to conserve resources.
- **Spare parts inventory for the facility.** Fewer spares kept on site means less expense - in purchase, storage, & inventory. Some of our data and tokamak operating experience lessons can support ITER decisions about spare part quantities and types to keep on hand.
- **Our experience with using trouble report systems may be needed to help set up the ITER Trouble Report system; the ISO 7385 std on data collection quality and ISO 6527 std on reliability data exchange may also support this effort**

# Where we are going from here

- **My vision for this task is to continue with the original goal of data collection - but addressing both generic and specific data. The task has also grown beyond the original goal by addressing safety-related issues about tokamak and facility operations, e.g., the Occupational Radiation Exposure and industrial safety data**
- **We can address other operating experience needs as they arise for ITER or other experiments**

# Next Task Meeting

- We typically have a task meeting every 1 to 2 years
- We have now seen most of the world's tokamaks
- I propose that, in view of restrictive budgets and the anticipated increasing workload for ITER, the next task meeting be held in conjunction with an international fusion conference, either:
  - 24th SOFT in Warsaw in September 2006
  - 17th TOFE in Albuquerque in November 2006
- Other suggestions for the next task meeting?